

## ***How do excessive nutrients impact the Chesapeake Bay?***

Nitrogen and phosphorus are necessary for the growth of plants and animals, but excessive nutrient levels contribute to the explosive growth of algae (shown below). As algae dies and decomposes, dissolved oxygen in the water decreases, which makes it difficult for the water body (in this case, the Chesapeake Bay) to sustain life.

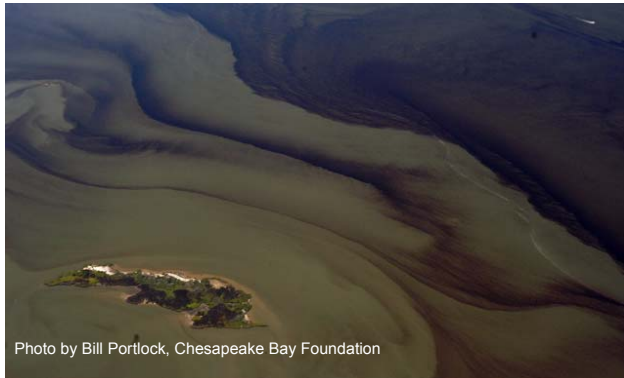


Photo by Bill Portlock, Chesapeake Bay Foundation

Every two years, DEQ assesses water quality data collected from Virginia's waters. The 2004 assessment determined that 83 % of the main stem of the Bay did not adequately support aquatic life.

The impact of excessive nutrients can be seen in the decline of habitat conditions in deep water for finfish and shellfish and in shallow water where submerged aquatic grasses sustain young fish, crabs and other species. This affects Virginia's food production and tourism industries as well as the quality of life for Virginians living on or near the Bay's shores.

## ***What are the sources of nutrients that are entering the Chesapeake Bay?***

Nutrients can enter the streams and rivers feeding the Bay by the discharge or release of treated wastewater from a facility or industry (called point sources) or by runoff from farms, subdivisions, construction sites or cities (called non-point sources).

## ***What has been done to address this problem?***

DEQ worked with the Virginia Department of Conservation and Recreation and the U.S. Environmental Protection Agency to estimate how much nitrogen and phosphorus could enter the Bay each year without harming aquatic life. This estimate, known as the Chesapeake Bay Tributary Strategy, set annual nutrient budgets or "allocations" for point source and non-point source discharges into each of the major tributary watersheds (Rappahannock, York, James, Shenandoah-Potomac, and the Eastern Shore). Tributaries are streams that supply or feed larger streams and rivers with water.

DEQ modified its Water Quality Management Plan regulation to assign annual load caps, called waste load allocations, to each tributary's largest point sources – facilities with the capacity to treat (or the design flow of) equal to or greater than 100,000 gallons per day for tidal waters or equal to or greater than 500,000 gallons per day for non-tidal waters. A load refers to the mass of nutrients carried in the water that is discharged by a facility. These more than 120 facilities, known as significant dischargers, represent about 95% of the nitrogen and phosphorus discharged into the Bay by point sources. The significant dischargers will be required to maintain their annual discharged nutrient loads below these allocations; in most cases, this will require the owners of these facilities (local governments or industries) to install improved wastewater treatment technology.

## ***How much will it cost for significant dischargers to comply with these regulations?***

One industry estimate is that the construction spending between 2007 and 2010 will be about \$1.6 billion.

Since the facilities are required to upgrade their nutrient removal capability in a relatively short time period, there is a high demand for construction materials and services. This demand is made more intense by the population growth in the Chesapeake Bay watershed and America's recovery from natural disasters (such as Hurricane Katrina), as well as overseas economic development.

## ***Is there a way to minimize the cost of construction, while taking the necessary steps to ensure the Bay's recovery?***

In 2005, the General Assembly passed a bill authorizing the development of a nutrient trading program and directing DEQ to develop a trading regulation and permit.

This permit differs from most others issued by DEQ in that it is concerned with the overall effect of the dischargers to the Bay's tributaries. Individual point source dischargers will be provided flexibility in how they help achieve the goals of the Tributary Strategy.

## ***What is the nutrient trading program?***

The trading program recognizes that some facilities will be better positioned to reduce their nutrient loads than others. It makes sense for these facilities to operate their plants as efficiently as possible, since it costs less to remove each pound of nitrogen or phosphorus from their waste streams, but there needs to be an incentive for them to do more than simply live within the nutrient budget assigned by the Water Quality Management Plan Regulation.

At the same time, some facilities face the prospect of paying high costs for the installation of equipment that will achieve more modest nutrient reductions. If these facilities could "buy" the additional pound reductions from more efficient facilities instead of spending more to install their own treatment, it would make sense to do so.

Because the Tributary Strategy is concerned more with the total of the discharges from all of the facilities in a tributary than with the performance of an individual facility, in most cases it makes little difference from where the nutrient reductions come.

Industry has estimated that trading could reduce construction costs between 2007 and 2010 by \$520 million.

***What effect will the trading program have on smaller facilities?***

Non-significant dischargers are not required to upgrade their facilities to remove nitrogen and phosphorus until they expand to a design flow of 40,000 gallons per day or greater.

DEQ recognizes that while the permits for existing non-significant dischargers limit oxygen demanding chemicals and toxics such as ammonia, there is a certain amount of nitrogen and phosphorus currently discharged by these facilities. When these facilities expand, they'll have to remain under those existing levels. They can do so by installing advanced nutrient treatment or by offsetting their load by "buying" nutrient reductions from significant dischargers or by land owners whose nutrient reductions already exceed what would be reasonably expected in the non-point aspect of the Chesapeake Bay Tributary Strategy.

New facilities will have stringent treatment requirements and will also have to offset whatever nutrient loads are discharged.

This will not eliminate growth in the Chesapeake Bay watershed. Developers and local government officials will have to plan ahead in order to ensure that growth doesn't add to the Bay's problems.

***What if a facility needed to "buy" nutrient reductions but can't find a seller?***

The General Assembly created the Water Quality Improvement Fund to finance water quality improvements in the Commonwealth, particularly in the Chesapeake Bay watershed. This fund will be used to finance point source and non-point source reductions, and the nutrient trading law and regulation also allow the purchase of nutrient reductions through this fund. Such a purchase is contingent upon pound reductions being achieved in the tributary for which the purchase is necessary, and the facility must demonstrate to DEQ that a good-faith effort has been made to acquire the reductions.

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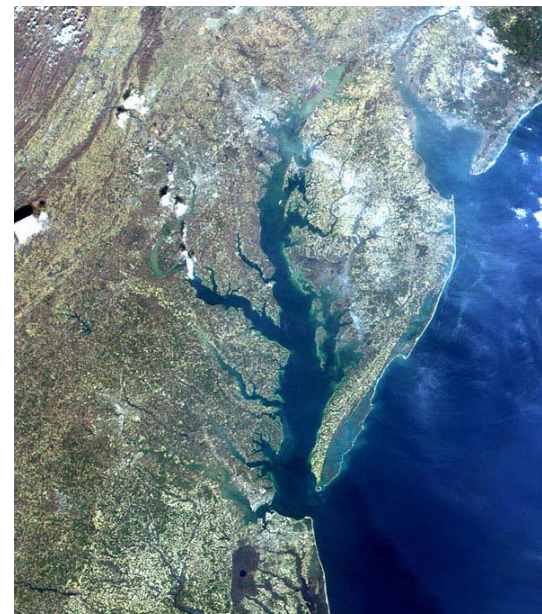
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**Permit to Control and Trade Nutrients within the Chesapeake Bay Watershed**



***Frequently Asked Questions***



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